Innovative Journal of Medical and Health Sciences
Received 12 May 2020 | Accepted 21 June 2020 | Published Online 25 June 2020

DOI: https://doi.org/10.15520/ijmhs.v10i06.3015
I Jour Med Health Science 10 (06), 1040–1044 (2020)
ISSN (O) 2589-9341 | (P) 2589-9341 IF:1.6

**ORIGINAL ARTICLE**

# Evaluation of Preferences in Learning Styles among Undergraduate Medical Students of a South Indian Medical College using the Grasha-Reichmann Student Learning Style Scales: A Cross-Sectional Study

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Abstract

**Background:**
Understanding various learning styles and framing teaching strategies accordingly has become a cornerstone of good teaching practice. Grasha and Riechmann (1996) consider learning styles as social interactions. They classify them into six categories: *Independent, Avoidant, Collaborative, Dependent, Competitive and Participant*, each of which has its own characteristics.
Hence, the present study was planned and conducted to evaluate the preferences in learning styles among the undergraduate medical students of a South Indian medical college, using the GRSLSS.
**Methodology:** The GRSLSS inventory was used for the assessment of learning style preferences among the participants. The survey questionnaire comprised of 60 questions, amongst which, ten questions were grouped for each of the six mentioned learning styles. The sum of the scores for the specified ten questions of each learning style was calculated and then averaged. The mean scores were calculated and compared using the Kruskal Wallis Test.
**Results:** Among the 134 participants, there was a statistically significant difference in the distribution of learning style patterns among individuals.($p<0.01$) There was a dominance of *Collaborative* and *Dependant* learning type, followed by the Independent style. The *Participant* and *Competitive* learning styles were sparsely distributed among the individuals.
**Discussion:** A mismatch between the teaching style of a teacher and the learning style of a student can render the teaching/learning process less effective. The present study highlighted that the student's learning process and academic performance can be improved by tailoring the instructional modality to the student's preference or style, whenever feasible.
Keywords: Grasha Reichman, Learning Scale, Learning Style, Student centered learning.

## 1 | BACKGROUND

Learning style can be defined as "the application, within a learning situation, of an individual's typical mode of problem solving, thinking, perceiving and remembering". [1] Different theories of learning styles exist, most of which are cognitive styles. VARK is a very popularly used instrument to determine learning styles. It is based on interaction and response to learning environment of the students and divides the learners into four categories; visual, auditory, reading and kinesthetic. [2] Grasha and Riechmann (1996) consider learning styles as social interactions and they define them as different roles that students have in interaction with classmates, teachers and course content. They classify them into six categories: *Independent, Avoidant, Collaborative, Dependent, Competitive* and *Participant*, each of which has its own characteristics. [3] Sternberg and Grigorenko (1997) and Keefe (1979) have also classified learners into four and five categories, respectively based on cognitive abilities.

In the present day, there is a perceived shift from teacher-centered learning to student- centered learning, in which students learn about internalizing information by themselves in different styles. Understanding various learning styles and framing teaching strategies accordingly has become a cornerstone of good teaching practice. It can influence the student's academic success and fulfill the objectives of teaching while making teaching strategies more effective. A literature review by Curry that included 46 citations of various concepts of learning styles in general education, and 16 additional citations, indicated a student's learning process can be improved by tailoring instructional modality to the student's preference or style. [4] It was also observed that a mismatch between the teaching style of a teacher and the learning style of a student can render the teaching/learning process less effective. [5] Hence, the present study was planned and conducted to evaluate the preferences in learning styles among the undergraduate medical students of a South Indian medical college, using the Grasha Reichmann Students Learning Styles Scale.

## 2 | METHODOLOGY

### 2.1 | Ethical Considerations

The study protocol was approved by the Institutional Review Board. The purpose and objective of the study was clearly explained to the participants through an information sheet. It was emphasized that their participation was optional (Annexure 1) and the confidentiality of data was assured. The participants were requested to sign a consent form attached with the questionnaire, to ensure their willingness to participate in the study. (Annexure 2)

### 2.2 | Study setting and design

The present observational cross sectional study was conducted in a South Indian medical college on 150 undergraduate Medical Students (MBBS) including both sexes. The survey was conducted as a part of the Foundation Course Initiative organized for the first year students admitted to the MBBS course, prior to the start of their regular classes.

### 2.3 | Procedure

The Grasha-Riechmann Student Learning Styles Scale (GRSLSS) inventory was used for the assessment of learning style preferences among the participants (Annexure 3). The survey questionnaire comprised of 60 questions, amongst which, ten questions were grouped for each of the six mentioned learning styles. The questions focused on student attitudes toward learning, various classroom activities and interactions with teachers, and peers rather than studying the relationships among methods, student style and achievement. The sum of the scores for the specified ten questions of each learning style was

**Supplementary information** The online version of this article (https://doi.org/10.15520/ijmhs.v10i06.3015) contains supplementary material, which is available to authorized users.

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calculated and then averaged. The six averages were used to measure the dominance in one or more of the six learning styles [6].The time provided to complete the questionnaire was 20 minutes.

### 2.4 | Data Analysis

All data was double entered into MS excel and checked for data entry errors. Statistical analysis was done using Graph pad Prism software Version 7.04. The mean scores were calculated for the six learning styles preferences and were compared using Kruskal Wallis Test. $P<0.05$ was considered to be statistically significant.

## 3 | RESULTS

Among the 134 participants, the mean scores for the distribution of learning style preferences were calculated (Table 1). There was a statistically significant difference in the distribution of learning style patterns among individuals ($p<0.01$) with a dominance of *Collaborative* and *Dependent* learning types, followed by the *Independent* style. (Fig.1) The *Participant* and *Competitive* learning styles were sparsely distributed among the individuals.

**TABLE 2:** Learning style preferences based on GRSLSS scores in the study population

| S.No | Styles | GRSLSS scores (Mean ± SD ) |
|---|---|---|
| 1. | Dependent | 3.599254±0.5391 |
| 2. | Collaborative | 3.117164±0.618211 |
| 3. | Participant | 3.703731±0.575621 |
| 4. | Independent | 3.691791±0.534389 |
| 5. | Avoidant | 2.908955±0.717186 |
| 6. | Competitive | 3.334328±0.564369 |

## 4 | DISCUSSION

The age old traditional way of designing courses is through a teacher centered approach where the teachers decided on the manner in which content was delivered. This approach is based on the assessment given by the teachers on how well the students have

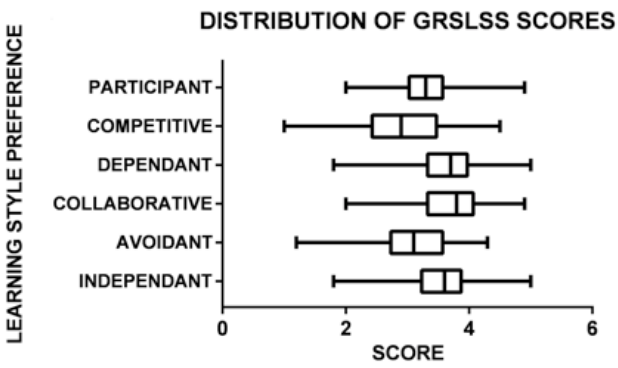


**FIGURE 1:** Distributionof learning style patterns among study participants

learned/reproduced the material taught to them. The current trend however is gradually shifting from the traditional teacher centered approach to a student centered approach. The student centered approach revolves around learning outcomes which express what the teachers expect from the students at the end of the learning period. [7] This major shift in teaching could be carried forward by assessing each individual student's mode and manner of perceiving, processing, storing and recalling knowledge through various learning styles.

The Grasha Reichmann's Learning Styles Scale was originally developed in 1974 with an objective to determine three learning styles; namely; *Dependent*, *Independent*, and *Collaborative* styles. Later in 1996, they further developed the scale to include other characteristics which lead up to 6 total styles, which included *Competitive*, *Avoidant* and *Participant*. [3] Among these six primary learning styles, each learner possesses a variety of them, though to varying degrees. Table 2 presents a brief general description of each learning behavior preference. [8]

Several other methods to assess student learning styles exist amongst which a very popularly used method is the VARK questionnaire. It is based on the nature in which humans assimilate knowledge through four sensory modalities; Visual (observing pictures, symbols or diagrams), auditory (listening, discussing), visual/iconic (reading and writing), and kinesthetic (using tactile sensory abilities such as smell and touch). [2] Over time, many other tools have also been developed to understanding the way individuals learn such as, Vermunt's inventory,

**TABLE 1:** General descriptionsof learning style preferences according to Grasha-Reichmann Student Learning Style Scales Inventory

| Learning Style | Description |
|---|---|
| Avoidant | Not enthusiastic about learning content and attending class. Do not participate with students and teachers in the classroom. Uninterested and overwhelmed by what goes on in class. |
| Dependent | Show little intellectual curiosity and learn only what is required. View teacher and peers as sources of structure and support and look to authority figures for specific guidelines on what to do. |
| Participant | Good citizens in class. Enjoy going to class and take part in as much of the course activities as possible. Typically eager to do as much of the required and optional course requirements as they can. |
| Independent | Students who like to think for themselves and are confident in their learning abilities. Prefer to learn the content that they feel is important and would prefer to work alone on course projects rather than with other students. |
| Competitive | Students who learn material in order to perform better than others in the class.<br>Believe they must compete with other students in a course for the rewards that are offered.<br>Like to be the center of attention and to receive recognition for their accomplishments in class. |
| Collaborative | Typical of students who feel that they can learn by sharing ideas and talents.<br>They cooperate with teachers and like to work with others |

Kolbe learning style indicator, Meyer Brigg Indicator,etc. [1] Literature reviews revealed that VARK is predominantly based on instructional preference and uses sensory modalities that are very vulnerable to change over the years. [2]

The authors of the present study chose GRSLSS because it took cognitive and affective behaviors into consideration instead of perceptual behavior of the students. GRSLSS also considered their interaction and participation in various learning environments. This model specifically helps teachers and professors to recognize the appropriate mode of teaching for specific learning styles. It suggests that learning styles can be identified through social and emotional dimensions such as attitudes toward learning, teachers, classmates and classroom. It presents a model based on students' responses to real classroom activities and not on the overall assessment of the personality or cognitive characteristics.

In the study population, the *Dependent* and *Collaborative* styles were found to be the most predominant. This finding could be attributed to the fact that the study was conducted on students newly inducted into the medical college. Teaching patterns in school makes the students accustomed to see teachers as the authority are seldom inquisitive and learn only what is needed by adapting to the structures created by the teachers-hence explains their *Dependent* nature. The *Collaborative* nature already present in these students could be tapped to their benefit by organizing small group discussions and team based problem solving exercises. Besides academic performance, enhancing their communication and interpersonal skills through workshops could be planned, given their *Collaborative* nature. For *Dependent* students teachers must help them overcome their anxiety and train them to be able to handle uncertain situations during learning on their own.

*Independent, Avoidant* and *Participant* learning style preferences were found to be moderately prevalent. Students with *Avoidant* style preference could be gently encouraged to take up responsibilities during the course of the year which would help them to take part in class activities and be more enthusiastic. Improving the *Collaborative* nature in students would automatically increase their participation in various

discussions and activities. Once they learn to work amongst others, the students will begin to develop interests in suggesting new ideas and start taking initiatives. All such endeavors could be further enhanced by providing incentives and encouragement to the learners.

It was interesting to note that *Competitive* type of learning style preference was the least prevalent, despite them being students newly enrolled into a professional course following a highly competitive entrance examination. Organizing and conducting events and competitions regularly within the institution and encouraging them to take part in various events could induce healthy competitive spirit amongst the students.

The students having just passed out of school are thrusted with the challenge of vast differences in learning and teaching styles in college as compared to school. The teachers should be ready to be more supportive to the students in the initial days to provide guidance to approach the medical curriculum. The planning and execution of a strong and structured mentoring program would be of great help to the students, both academically and personally. Further, efforts to improve their self and active learning could be taken through various assignments. Feedback, when provided intermittently and effectively, would help the learners to take advantage of their style preferences and perform better.

The limitations of the study comprised of the narrow selective approach of one questionnaire that evaluated the learning style preferences in terms of behavioral attributes towards learning. The cognitive abilities and sensory modalities, as addressed in other questionnaires were not evaluated, the authors felt the need to use a combination of more than one questionnaire to arrive at a complete evaluation and understanding of learning style preferences.

## 5 | CONCLUSION

The findings of the present study highlight the need of understanding the learning style preferences of students at the start of the medical academic year for freshmen. Administering GRSLSS during the foundation course would let the faculty and the learners have an early understanding of the learning preferences as both individuals and as a classroom, respectively. Faculty should be appraised of such preferences existing in the learner population so that the teaching and assessment methods could be tailored accordingly. The learner would also be more mentally prepared to frame learning strategies for the upcoming year as he confronts the differences in the curriculum and learning environments. Although, modifying the teaching styles to cater to individual needs would be difficult for the teachers, documenting the details about the learning style preferences of each learner would be of great use during mentoring and feedback session as a part of the formative assessment.

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**How to cite this article:** Prathibha D.K.M., Pillai N.S. Evaluation of Preferences in Learning Styles among Undergraduate Medical Students of a South Indian Medical College using the Grasha-Reichmann Student Learning Style Scales: A Cross-Sectional Study . Innovative Journal of Medical and Health Sciences. 2020;1040−1044. https://doi.org/10.15520/ijmhs.v10i06.3015